12-4-74

MICHIGAN WATER RESOURCES COMMISSION
BUREAU OF WATER MANAGEMENT
ENVIRONMENTAL PROTECTION BRANCH
DEPARTMENT OF NATURAL RESOURCES

Report of an
Industrial Wastewater Survey
Conducted at
BROWN CORPORATION
All Outfalls No. 340081
Ionia County
Ionia, Michigan
June 5-7, 1974

Survey Summary

Wastewater monitoring was performed during two twenty-four hour survey periods at Brown Corporation starting Wednesday, June 5, 1974.

Brown Corporation discharged during the respective survey periods, 0.117 MGD and 0.151 mgd of process and cooling wastewaters.

Quantitative analyses of the 24-hour composite samples revealed no appreciable problems for the monitored constituents. A separate grab composite for select hydrocarbons, however, did result in a concentration of 440 ppb phthalates.

A milky substance was observed at 11:30 am on June 7, 1974. A grab sample was taken and the results, which are shown on Table 2, revealed high concentrations of total phosphorus, 26 mg/l, and oil & grease, 55 mg/l. A second grab sample collected one hour later for oil & grease analyses resulted in a concentration of 86 mg/l freon extractables.

Purpose of Survey

The purpose of the survey was to determine the quality and quantity of wastewater being discharged by the Brown Corporation to surface waters adjacent to the Grand River.

Water Supply, Wastewater and Treatment

Water supply comes from the City of Ionia. Wastewater from the plant comes from arc-welder and air compressor cooling units and overflow from paint booths and bonderizer. Sanitary sewage is disposed of through the city sewage system.

Survey Procedure

An 18" rectangular weir was installed on the outfall prior to its entering the swamp adjacent to the Grand River.

The weir was equipped with a water level recorder and an automatic sampler. The water level recorder provided a continuous account of the liquid level or head above the crest of the weir on a head versus time graph for the duration of each survey period. The total volume of wastewater over the weir during the survey period was computed from the graph. The automatic sampler obtained samples proportional to the instantaneous flow over the weir at 10-minute intervals. These individual samples were deposited in a clean container to make up a composite sample representative of the total flow over the weir during the survey period.

Individual grab samples were collected from the final outfall for oil analyses.

A 48-hour grab composite was collected for phthalates and polychlorinated biphenols analyses (Table 3).

The composite samples and grab samples were transported to the Bureau of Water Management laboratory located in Lansing for selected quantitative physical and chemical analyses. The following formula was used to compute the pounds per day of various wastewater constituents discharged. The formula makes use of the concentrations from the quantitative analysis and the monitored flow to yield the pounds per day as follows:

lbs/day = flow (mgd) x conc. (mg/l) x unit weight of water (8.34 lbs/gal).

The bacteria samples were transported to the Michigan Department of Public Health, Bureau of Laboratories located in Lansing for selected quantitative bacteriological analyses.

The results of the physical, chemical and bacteriological analyses are presented in Tables 1, 2 and 3.

Table 1 Quantitative analyses of the two 24-hour composite samples collected from Brown Corporation discharge, to waters adjacent to the Grand River, to determine the concentration of the wastewater constituents present in the samples, plus the computed pounds per day (lbs/day) of these constituents being discharged. Also noted are the highest and lowest flow rates recorded during the respective survey periods.

From	6-5-74 - 2:00 pm		6-6-74 - 1:00 pm	
To	6-6-74 - 1:00 pm		6-7-74 - 12:30 pm	
Total flow monitored (gal)	111,000		146,000	
Computed flow rate (mgd) *	0.117		0.151	
Highest flow rate (mgd)	0.255 @ 10:06 am		0.196 @ 7:25 am	
Lowest flow rate (mgd)	0.050 @ 2:55 pm		0.083 @ 12:06 pm	
pH	7.7		8.2	
	mg/l	lbs/day	mg/l	lbs/day
5-day BOD	6	6.0	< 5	--
COD	33	32	37	47
Total solids	N.A.	N.A.	468	589
Total volatile solids	N.A.	N.A.	224	282
Suspended solids	4	4	1	1
Suspended volatile solids	0	0	0	0
Soluble orthophosphate-P	1.1	1.1	1.2	1.5
Total phosphorus-P	1.4	1.4	1.4	1.8
Nitrate nitrogen-N	2.7	2.6	2.4	3.0
Ammonia nitrogen-N	0.22	0.21	0.30	0.30
Organic nitrogen-N	0.83	0.81	0.40	0.50
Detergents	N.A.	N.A.	0.2	0.2
Hexane extractables	N.A.	N.A.	4	5.0

N.A. - Not Analyzed
* - Flow rates used in the computation of lbs/day.

Table 2 Quantitative analyses of grab samples.

1st Grab Sample - 11:30 am - June 7, 1974

Parameter	mg/l
COD	440
BOD	30
pH	7.2 (S.U.)
Suspended solids	66
Suspended volatile solids	62
Soluble orthophosphates-P	11
Total phosphates	26
Nitrate nitrogen-N	5.0
Ammonia nitrogen-N	8.1
Organic nitrogen-N	0.3
Total volatile solids	404
Total solids	786
Detergent	2.0
Freon extractables	55

2nd Grab Sample - 12:30 pm - June 7, 1974

Parameter	mg/l
Freon extractables	86

Table 3 Quantitative analyses of grab composite for select hydrocarbons.

Polychlorinated biphenols	< 1 ppb
Phthalates	440 ppb

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Physical & Chemical Analyses by:	James Bedford, Chemist
Report by:	Sidney Beckwith Water Quality Appraisal Section Michigan Water Resources Commission Bureau of Water Management Environmental Protection Branch Department of Natural Resources

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